EXHIBIT 12

WILEY ELECTRICAL AND ELECTRONICS ENGINEERING DICTIONARY

By the same author

English–Spanish, Spanish–English Electrical and Computer Engineering Dictionary, published by John Wiley & Sons, Inc.

Wiley's English–Spanish, Spanish–English Business Dictionary

Wiley's English–Spanish, Spanish–English Chemistry Dictionary

Wiley's English–Spanish, Spanish–English Dictionary of Psychology and Psychiatry

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WILEY ELECTRICAL AND ELECTRONICS ENGINEERING DICTIONARY

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PREFACE AND NOTES ON THE USE OF THIS DICTIONARY

This dictionary has over 35,000 entries, each of which occupies a place in one or more of the many areas of expertise encompassed by electrical and electronics engineering. All available sources were consulted, seeking to ascertain the exact manners in which each term is currently utilized. Textbooks, handbooks, treatises, instruction manuals, theses, articles, reports, Usenet postings, and so on, were researched during the process of selecting the terms and writing their definitions, with a good number of entries having multiple provided connotations.

The Internet was used extensively throughout this project, and if one or more persons or entities used a given technical term in the areas covered by this dictionary, there is a decent chance it was taken into consideration. If any given words or phrases were used frequently by multiple people, in varied settings, and when referring to serious endeavors, there is a pretty good chance it can be found in this dictionary. Even so, some terms that continue to appear may not be found here. If a user feels that a given word or phrase not found in this dictionary should be added to a future edition, or wishes to otherwise comment on this book, an email may be sent to the author at: **wileyieee@yahoo.com.**

There are no special rules for the use of this dictionary. The user simply looks up the desired term to find its definition, plus other practical information when appropriate. When a word or phrase is the same as another, this is clearly stated so as to easily find the definition.

This dictionary could not have been prepared without the contributions of George J. Telecki, Associate Publisher at John Wiley & Sons. He had the idea for this dictionary, suggested the approach and format, and throughout the project provided inestimable support and guidance.

This dictionary has been prepared within the exquisite nature settings of Northwestern Austria. Mr. Wolfgang Gießer is the person who determined that I should be allowed to perform my work as an author in this wonderful country. I am tremendously grateful to him for kindly providing me with the opportunity to live here.

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Austria, Europe
October, 2003

Also called **gate circuit (2)**. **4.** In a field-effect transistor, the electrode which controls the flow of current through the channel. Small variations in the voltage applied to the gate result in large variations in the current passing through a field-effect transistor. The gate is analogous to the base of a bipolar junction transistor. Its symbol is **G**. Also called **gate electrode**. **5.** A control electrode in a device such as a field-effect transistor or thyristor.

gate array An IC consisting of an array of **gates (2)**. The specific arrangement of the gates, and hence their function, is determined late in the manufacturing process. This customization for a specific application can save design and manufacturing time, but a significant proportion of the chip may go unused. Also called **logic array**.

gate circuit **1.** Same as **gate (2)**. **2.** Same as **gate (3)**.

gate-controlled A circuit, switch, or device which is controlled by a gate circuit.

gate-controlled switch **1.** Same as **gate turn-off switch**. **2.** A switch controlled by a gate circuit.

gate current The current flowing through a **gate (3)**, **gate (4)**, or **gate (5)**.

gate electrode Same as **gate (4)**.

gate generator A circuit or device which generates **gate pulses**.

gate pulse A pulse which triggers a gate circuit to pass a signal. Used, for instance, to actuate a gate-controlled semiconductor device.

gate signal A signal which triggers a gate circuit to pass a signal. Used, for instance, to actuate a gate-controlled semiconductor device.

gate trigger current The current necessary to trigger a gate circuit to pass a signal.

gate trigger voltage The voltage necessary to trigger a gate circuit to pass a signal.

gate turn-off A device similar a silicon-controlled rectifier, but whose gate structure provides for more flexibility in switching it on or off. Also spelled **gate turnoff**.

gate turn-off switch A device similar a silicon-controlled rectifier, with the difference that a negative pulse applied to its gate can be used to switch it off. Also spelled **gate turnoff switch**. Also called **gate-controlled switch (1)**.

gate turnoff Same as **gate turn-off**.

gate turnoff switch Same as **gate turn-off switch**.

gate voltage The voltage applied a **gate (3)**, **gate (4)**, or **gate (5)**.

gated flip-flop A flip-flop equipped with a mechanism which does not allow both states to be low, or 0, simultaneously.

gated sweep **1.** In radars, a sweep whose start and duration are controlled, so as to minimize unwanted echoes. **2.** A circuit providing a **gated sweep (1)**.

gateway **1.** A device which enables networks to connect by performing the necessary protocol conversions. For example, a gateway could carry out the translation between T1and E1, between Ethernet and Token Ring, or between messaging protocols. **2.** In a communications network, or multiple interconnected networks, a device or software which determines where packets, messages, or other signals travel to next. A gateway, using resources such as header information, algorithms, and router tables, establishes the best available path from source to destination. Within the OSI Reference Model, a gateway operates at the network layer. Also called **router**, or **network router**.

gateway page A Web page created with given characteristics, such as multiple appearances of specific keywords, so as to rank high on a particular search engine. Also called **doorway page**, **jump page**, **entry page**, or **bridge page**.

gather write A single data write operation in which two or more non-contiguous buffers or locations are used. A **scatter read** is utilized to access such data.

gating **1.** The process of selecting the portions of a signal or wave that exist during selected time intervals, or that fall between specified amplitude limits. **2.** The use of a gate circuit to control a circuit or device. Also, to control said device during selected portions of a cycle.

gating circuit A circuit utilized for **gating**.

gauge Also spelled **gage**. **1.** A device or instrument which serves to measure a given magnitude, or which is utilized for testing. **2.** A scale or standard of measurement. **3.** A scale or standard utilized for sizing wires, tubing, sheets, rods and the such. Used, for instance, to determine the thickness or diameter of such a material. Also, a measurement expressed in such terms. For example, a 14-gauge wire.

gauge pressure Pressure relative to the ambient pressure. This contrasts with **absolute pressure**, which is measured relative to that found in an absolute vacuum. Also spelled **gage pressure**.

gauss The unit of magnetic flux density or magnetic induction in the cgs system. One gauss is equal to10^{-4} tesla, or 1 maxwell per centimeter squared. Also known as **abtesla**. Its symbol is **G**, or **Gs**.

Gauss' law **1.** A law which states that the electric flux through any closed surface is proportional to the electric charge contained within said surface. Also called **Gauss' law for electricity**. **2.** Same as **Gauss' law for magnetism**.

Gauss' law for electricity Same as **Gauss' law (1)**.

Gauss' law for magnetism A law which states that the net magnetic flux through any closed surface is zero. That is, the amount of magnetic flux that leaves a closed space is the same as that which enters it. Also called **Gauss' law (2)**.

Gaussian channel A communications channel whose only noise present is **Gaussian noise**.

Gaussian curve A curve corresponding to a **Gaussian distribution**. It is in the shape of a symmetrical bell. Also called **bell-shaped curve**, or **normal curve**.

Gaussian distribution For a random variable, a probability distribution which is symmetrical about the mean value, and which continuously diminishes in value until reaching zero at each extreme. It is utilized to determine the probability of the value of the variable falling within a given interval of values, and when graphed has the shape of a symmetrical bell. Various phenomena, such as some natural frequencies, have a Gaussian distribution. Also called **bell-shaped distribution**, or **normal distribution**.

Gaussian error An error which has a **Gaussian distribution**. Random errors usually have such a distribution.

Gaussian filter A filter whose response curve has a **Gaussian distribution**.

Gaussian noise Noise which has a **Gaussian distribution**. The frequency distribution of such noise follows a Gaussian curve.

Gaussian noise generator A noise generator whose output follows a **Gaussian distribution**.

gaussmeter A magnetometer which is calibrated in gauss, or in a multiple of gauss such as kilogauss.

Gb Abbreviation of **gigabit**.

GB Abbreviation of **gigabyte**.

GbE Abbreviation of **Gigabit Ethernet**.

Gbit Abbreviation of **gigabit**.

Gbits/sec Abbreviation of **gigabits per second**.

GBP Abbreviation of **gain-bandwidth product**.

Gbps Abbreviation of **gigabits per second**.

GBps Abbreviation of **gigabytes per second**.